# T08D01 – (8.1) ****Theories of Acids and Bases Notes****

Name ……………………………………………………..

1. 8.1.1 Define acids and bases according to the Brønsted–Lowry and Lewis theories.(1)
2. 8.1.2 Deduce whether or not a species could act as a Brønsted–Lowry and/or a Lewis acid or base. (3)
3. 8.1.3 Deduce the formula of the conjugate acid (or base) of any Brønsted–Lowry base (or acid). (3)

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|  | **Focus (theory)** | **Acid Definition** | **Base Definition** |
| **Brønsted–Lowry** |  |  |  |
| **Lewis** |  |  |  |
| **Arrhenius** |  |  |  |

* 1. According to Brønsted–Lowry, who label the acid and base for both the forward and reverse reactions:

HCl (g) + H2O (l) ⇌ H3O+(aq) + Cl-(aq)

* 1. What is a conjugate acid base pair?
  2. What does it mean for a substance to be amphiprotic?
  3. Show that water is amphiprotic by labelling the conjugate pairs for the reaction of water with:
     1. hydrochloric acid:
     2. ammonia:
  4. How do the titles of weak/strong and acid/base change in an equation regarding conjugate pairs?
  5. What does the proticity of acids mean?

* + 1. Give an example of each, and provide an equation for the deprotonation (1 at a time):
       1. Monoprotic:
       2. Diprotic:
       3. Triprotic:
  1. Show how HSO3- can act as both an acid and a base:
  2. What is a dative bond?
     1. Show how NH3 can form a dative bond with
        1. H+
        2. BF3
     2. Many transition metals allow for the formation of dative bonds through their empty 3d orbitals, draw an example of [Fe(H2O)6]3+:
  3. Provide a diagram for how acids react with different substances:
  4. Show the difference between an alkali and a base:
  5. How is it that all Brønsted–Lowry acids are Lewis acids, but the reverse cannot be said?